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IT FDN 110

## Assignment 05

### Key Value Pairs & Dictionaries

In python data can be stored in a dictionary, which is a data structure composed of key value pairs. Key value pairs can be thought of in terms of spreadsheet, where the key is the column name and the value are the values in the rows corresponding to that column. Keys must be unique while values do not have to be. Dictionaries are mutable so they can be altered. The syntax used for dictionaries in python are curly brackets and colons, with a comma in between the items in the dictionary.

There are a few common functions to change the contents of a dictionary, `dict.update()`, `dict.pop()`, and `dict.popitem()`. `Dict.update()` takes the key and value as an argument and will create it if it does not exist. `Dict.pop()` will remove a key value from the dictionary based on the key value input. `Dict.popitem()` is used frequently to check if a dictionary contains any values, as this removes an item from the dictionary arbitrarily.

Figure 1 below shows an example of dictionaries.

```
# empty dictionary
my_dict = {}
# dictionary with integer keys
my_dict = {1: 'apple', 2: 'ball'}
# dictionary with mixed keys
my_dict = {'name': 'John', 1: [2, 4, 3]}
# using dict()
my_dict = dict({'apple', 2:'ball'})
# from sequence having each item as a pair
my_dict = dict([(1,'apple'), (2,'ball')])
```

JSON

## Exception Handling

Exception handling is the process of responding to and recovering from error conditions in your program. In the python script for assignment 5 I have included a few error handling statements. We can see these error handling statements on the `student_first_name` and `student_last_name` strings, which serve to enforce the users enter alphabetic characters, not numbers or symbols. The other important thing to include with error handling is an informative message to the user if possible, although there should be security considerations if the program is dealing with any sort of password or user input to not provide detailed messages to a malicious actor.

```
# Input user data
if menu_choice == "1": # This will not work if it is an integer!
    student_first_name = input("Enter the student's first name: ")
    if not student_first_name.isalpha():
        raise ValueError("The first name should not contain numbers.")
    student_last_name = input("Enter the student's last name: ")
    if not student_last_name.isalpha():
        raise ValueError("The last name should not contain numbers.")
    course_name = input("Please enter the name of the course: ")
    student_data = [student_first_name, student_last_name, course_name]
    students.append(student_data)
    print(f"You have registered {student_first_name} {student_last_name} for {course_name}.")
    continue
```

## Github

GitHub is a website and cloud-based service that helps developers store and manage their code, as well as track and control changes to their code. Github allows users to track changes to shared scripts via version control. By using Github users can test code and then merge to and changes can always be reverted. Github is a particular company that uses Git, an open source version control system. The vast majority of developers use Git.